

Heat & Mass Transfer MCQ Question Answer

Visit <https://competitive-exam.in> for more MCQ

Question: 1. All radiations in a black body are

- Option A. Reflected
- Option B. Refracted
- Option C. Transmitted
- Option D. Absorbed

Question: 2. According to Stefan Boltzmann law, the total radiation from a black body per second per unit area is directly proportional to the

- Option A. Absolute temperature
- Option B. Square of the absolute temperature
- Option C. Cube of the absolute temperature
- Option D. Fourth power of the absolute temperature

Question: 3. The logarithmic mean temperature difference (t_m) is given by (where Δt_1 and Δt_2 are temperature differences between the hot and cold fluids at entrance and exit)

- Option A. $t_m = (\Delta t_1 - \Delta t_2) / \log_e (\Delta t_1 / \Delta t_2)$
- Option B. $t_m = \log_e (\Delta t_1 / \Delta t_2) / (\Delta t_1 - \Delta t_2)$
- Option C. $t_m = t_m = (\Delta t_1 - \Delta t_2) \log_e (\Delta t_1 / \Delta t_2)$
- Option D. $t_m = \log_e (\Delta t_1 - \Delta t_2) / \Delta t_1 / \Delta t_2$

Question: 4. According to Newton's law of cooling, the heat transfer from a hot body to a cold body is

- Option A. Directly proportional to the surface area
- Option B. Directly proportional to the difference of temperatures between the two bodies
- Option C. Either (A) or (B)
- Option D. Both (A) and (B)

Question: 5. When absorptivity (α) = 1, reflectivity (ρ) = 0 and transmissivity (τ) = 0, then the body is said to be a

- Option A. Black body
- Option B. Grey body
- Option C. Opaque body
- Option D. White body

Question: 6. In convection heat transfer from hot flue gases to water tube, even though flow may be turbulent, a laminar flow region (boundary layer of film) exists close to the tube. The heat transfer through this film takes place by

- Option A. Convection

- Option B. Radiation
- Option C. Conduction
- Option D. Both convection and conduction

Question: 7. The ratio of Nusselt number and the product of Reynold's number and Prandtl number is equal to

- Option A. Stanton number
- Option B. Biot number
- Option C. Peclet number
- Option D. Grashoff number

Question: 8. The transfer of heat by molecular collision is smallest in

- Option A. Solids
- Option B. Liquids
- Option C. Gases
- Option D. None of these

Question: 9. Thermal diffusivity is a

- Option A. Function of temperature
- Option B. Physical property of a substance
- Option C. Dimensionless parameter
- Option D. All of these

Question: 10. The radiation emitted by a black body is known as

- Option A. Black radiation
- Option B. Full radiation
- Option C. Total radiation
- Option D. All of these

Question: 11. Unit of thermal conductivity in M.K.S. units is

- Option A. $\text{K cal/kg m}^2 \text{ } ^\circ\text{C}$
- Option B. $\text{K cal m/hr m}^2 \text{ } ^\circ\text{C}$
- Option C. $\text{K cal/hr m}^2 \text{ } ^\circ\text{C}$
- Option D. $\text{K cal m/hr } ^\circ\text{C}$

Question: 12. Which of the following property of air does not increase with rise in temperature?

- Option A. Thermal conductivity
- Option B. Thermal diffusivity
- Option C. Density
- Option D. Dynamic viscosity

Question: 13. The amount of radiation mainly depends upon the

- Option A. Nature of the body
- Option B. Temperature of the body
- Option C. Type of surface of the body
- Option D. All of these

Question: 14. Two balls of same material and finish have their diameters in the ratio of 2: 1 and both are heated to same temperature and allowed to cool by radiation. Rate of cooling by big ball as compared to smaller one will be in the ratio of

- Option A. 1 : 1
- Option B. 2 : 1
- Option C. 1 : 2
- Option D. 4 : 1

Question: 15. Heat flows from one body to other when they have

- Option A. Different heat contents
- Option B. Different specific heat
- Option C. Different atomic structure
- Option D. Different temperatures

Question: 16. The rate of heat flow through a body is $Q = [kA (T_1 - T_2)]/x$. The term x/kA is known as

- Option A. Thermal coefficient
- Option B. Thermal resistance
- Option C. Thermal conductivity
- Option D. None of these

Question: 17. A perfect black body is one which

- Option A. Is black in colour
- Option B. Reflects all heat
- Option C. Transmits all heat radiations
- Option D. Absorbs heat radiations of all wave lengths falling on it

Question: 18. Planck's law holds good for

- Option A. Black bodies
- Option B. Polished bodies
- Option C. All coloured bodies
- Option D. All of the above

Question: 19. In counter flow heat exchangers

- Option A. Both the fluids at inlet (of heat exchanger where hot fluid enters) are in their coldest state
- Option B. Both the fluids at inlet are in their hottest state
- Option C. Both the fluids at exit are in their hottest state

Option D. One fluid is in hottest state and other in coldest state at inlet

Question: 20. The ratio of the thickness of thermal boundary layer to the thickness of hydrodynamic boundary layer is equal to (Prandtl number) n , where n is equal to

Option A. $-1/3$

Option B. $-2/3$

Option C. 1

Option D. -1

Question: 21. The thermal diffusivities for solids are generally

Option A. Less than those for gases

Option B. Less than those for liquids

Option C. More than those for liquids and gases

Option D. More or less same as for liquids and gases

Question: 22. Heat transfer takes place as per

Option A. Zeroth law of thermodynamics

Option B. First law of thermodynamic

Option C. Second law of the thermodynamics

Option D. Kirchoff's law

Question: 23. Moisture would find its way into insulation by vapour pressure unless it is prevented by

Option A. High thickness of insulation

Option B. High vapour pressure

Option C. Less thermal conductivity insulator

Option D. A vapour seal

Question: 24. The ratio of the emissive power and absorptive power of all bodies is the same and is equal to the emissive power of a perfectly black body. This statement is known as

Option A. Kirchoffs law

Option B. Stefan's law

Option C. Wien' law

Option D. Planck's law

Question: 25. Heat transfer in liquid and gases takes place by

Option A. Conduction

Option B. Convection

Option C. Radiation

Option D. Conduction and convection

Question: 26. Unit of thermal diffusivity is

- Option A. m^2/hr
- Option B. $\text{m}^2/\text{hr } ^\circ\text{C}$
- Option C. $\text{kcal}/\text{m}^2 \text{ hr}$
- Option D. $\text{kcal}/\text{m} \cdot \text{hr } ^\circ\text{C}$

Question: 27. The ratio of surface convection resistance to the internal conduction resistance is known as

- Option A. Grashoff number
- Option B. Biot number
- Option C. Stanton number
- Option D. Prandtl number

Question: 28. 40% of incident radiant energy on the surface of a thermally transparent body is reflected back. If the transmissivity of the body be 0.15, then the emissivity of surface is

- Option A. 0.45
- Option B. 0.55
- Option C. 0.40
- Option D. 0.75

Question: 29. Thermal conductivity of air at room temperature in $\text{kcal}/\text{m hr } ^\circ\text{C}$ is of the order of

- Option A. 0.002
- Option B. 0.02
- Option C. 0.01
- Option D. 0.1

Question: 30. The transfer of heat by molecular collision is known as

- Option A. Conduction
- Option B. Convection
- Option C. Radiation
- Option D. None of these

Answer Sheet

1	D	
2	D	
3	A	
4	D	
5	A	
6	C	
7	A	
8	C	
9	B	
10	D	
11	B	
12	C	
13	D	
14	C	
15	D	
16	B	
17	D	
18	A	
19	B	
20	A	
21	C	
22	C	
23	D	
24	A	
25	B	
26	A	
27	B	
28	A	
29	B	
30	B	